

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2004/051329

International filing date (day/month/year)
01.07.2004

Priority date (day/month/year)
01.07.2003

International Patent Classification (IPC) or both national classification and IPC
H04B10/155

Applicant
MARCONI COMMUNICATIONS GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

10/562760
International application No.
PCT/EP2004/051329

IAP20 Rec'd PCT/PTO 28 DEC 2005

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

 International application No.
PCT/EP2004/051329

Box No. II Priority

1. ☒ The following document has not been furnished:
- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
 - ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).
- Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------|
| Novelty (N) | Yes: Claims | 1-14 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 1-14 |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | 1-14 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/EP2004/051329

Re Item V

IAP20 Rec'd PCT/PTD 28 DEC 2005

1. Reference is made to the following document:

- D1:** EP 0 718 990, published on 26.06.1996,
D2: WO 01/25847, published on 12.04.2001, and
D3: US 2002/196508, published on 26.12.2002

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claim 1** lacks inventive step in the sense of Article 33(3) PCT.

Document D1, which is considered the closest prior art, discloses (the references in parentheses applying to this document):

A transmitter (see Fig.1) for transmitting an optical RZ-DPSK communication signal (see abstract and col.3, ln.41-42) having a source (Fig.1, ref.12) for an optical carrier, an electro-optical modulator (Fig.1, ref.16) which comprises at least one element (see Fig.4, refs.163, 164), the optical path length of which being adapted to be modified by an electrical driving signal (as it is well-known from Mach-Zehnder interferometers; see col.4, ln.40-56 and description of the present application on p.3, ln.8-10), for intensity modulating the optical carrier based on the driving signal (cf. col.4, ln.40-56), and a driver circuit (Fig.1, ref.24) for generating the driving signal from an electrical communication signal (output of ref.22 in Fig.1), wherein

the driving signal (Fig.1, ref.17) has a positive and a neutral signal state (see graph A in Fig.3), wherein in presence of the neutral state of the driving signal the transmission of the modulator becomes zero (see Fig.3 and col.6, ln.20-23), and the presence of an impulse causes a transmission of the modulator which is different from zero (see Fig.3 and col.5, ln.15-20) and which causes a phase shift (see col.5, ln.58 to col.6, ln.3).

The only difference between the subject-matter of claim 1 and the disclosure of D1 is that claim 1 further defines the driving signal being an impulse-type signal with two different values of the impulses (upon Fig.2, a positive and a negative one), instead of the unique positive impulse disclosed by D1.

However, this is a normal design variant falling within the scope of customary practice followed by persons skilled in the art, and with independence of the type of signal used for driving the modulator, the transmitter disclosed by document D1 achieves the same technical effect or solve the same problem as the one defined by the present application (see description on p.2, ln.29-35), namely the use of only one optical modulator for implementing a transmitter of RZ-DPSK signals.

Therefore, the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

3. Dependent claims **2-14** do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT), the reasons being as follows:

3.1. The additional feature of dependent claim 2 is disclosed in D1 (see col.6, ln.8-9).

3.2. The additional features of dependent claim 3 are either disclosed in D1 (see interferometer controllable by driving signal on col.4, ln.44-56 and in Fig.1) or correspond to mere choices among a number of obvious alternatives commonly used by persons skilled in the art (path difference between arms being half of the carrier wavelength; see for example D2, p.2, ln.28 to p.3, ln.9).

3.3. The additional features of dependent claims 4, 6 and 7 are well known features commonly used in the design of transmitters for communication systems (see for example D3, paragraph [0081] and Figs.15, 16).

3.4. The additional feature of dependent claim 5 is disclosed in D2 (see Fig.5, refs.142, 144).

3.5. The additional features of dependent claims 8-14 are considered to be mere choices from a number of obvious alternatives from which the skilled person would select without exercising any inventive step (Article 33(3) PCT).